REMARKS

Claims 1-20 are pending in this application with claims 1 and 7 being amended by this response. Claim 1 has been amended to clarify the characteristics of the present claimed invention. Support for these amendments can be found throughout the specification and more specifically on Page 6, lines 10-17. Additionally, claim 7 has been amended to clarify the characteristics of the present claimed invention. Support for the amendments to claim 7 can be found throughout the specification and more specifically in figure 2 and on page 12, lines 1-4 and 12-16. Thus, it is respectfully submitted that no new matter is added by these amendments.

Rejection of Claims 1, 3, 5, 6, 8-10 and 19-20 under 35 USC § 102(e)

Claims 1, 3, 5, 6, 8-10 and 19-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Katata et al. (US Patent No. 6,088,061).

The present claimed invention provides a process for the blockwise coding of digital video images in which each block is assigned a specified resolution dependent on a zone in which this block is located. An image comprises at least two zones to which different resolutions are assigned. Each image is coded by transforming the blocks from the spatial domain to the frequency domain. Mixed blocks straddling two zones of different resolutions are detected and constructed by determining the zone corresponding to each pixel of these mixed blocks. By allocating the resolution of a specified zone to this pixel we get constructed mixed blocks which are transformed in the frequency domain.

Katata et al. neither disclose nor suggest that "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

Katata et al. describe a video coding device which is capable of making coded data having a hierarchical structure wherein a specified area of each frame is selected. The position and shape of the selected area is encoded and a pixel value of the selected area is encoded as lower-layer coded data. A pixel value of a whole image is encoded as first upper-layer coded data by using pixel values of already decoded images of the lower-layer and the first upper layer. A pixel value of the selected area is encoded as second upper-layer coded data by using pixel values of already decoded images of the lower-layer and the second upper layer.

The present claimed invention describes the construction of blocks having different resolutions and the transformation of those blocks in the frequency domain. The transformation is applied to either a whole block having different resolutions or part of a block having different resolutions. The prior art discloses the transformation of blocks of a first resolution and transformation of blocks of a second resolution, but not transformation of blocks with mixed resolutions.

Specifically, Katata et al. neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected" and "transformed in the frequency domain" as recited in claim 1 of the present invention, Katata et al. describe that "the background image and part images may be independently encoded...considering the background image as a lower-layer and the part images as upper-layers...Each upper-layer image can be effectively encoded by predicting its pixel value from that of the lower-layer image" (Col. 17, lines 35-40). Thus, Katata et al. merely disclose encoding whole blocks of a single layer—either independently or dependently.

Furthermore, Katata et al. neither disclose nor suggest that "mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks" as recited in claim 1 of the present invention. Katata et al. describe the

reconstruction of an image block by block and then the application of a weighting function (column 15, lines 31-34 and figure 20). The weighting function corresponds to the alpha plane and is executed after the blocks of a single resoltion have been transformed. In contrast, the present claimed invention reconstrcuts an image by reconstructing the single resolution blocks in a single resolution scheme and reconstructing mixed resolution blocks pixel by pixel to display both resolution schemes. Thus, the reconstruction of an image as described by Katata et al. is wholly different than the image reconstruction described by the present claimed invention as Katata et al. do not even suggest the construction of mixed resolution blocks.

In essence, the present claimed invention is concerned with minimizing the block artefacts when blockwise processing pixels for the coding of images involving several resolutions (page 4, lines 26-29). Thus, the present claimed invention introduces a process comprising a step of calculating or constructing a mixed block having more than one resolution and a transformation of the mixed block. The transformation is not of blocks of the source image, but of reconstructed blocks of pixels having different resolutions. This transformation takes into account the different resolutions within the block. Using the method described above, the present claimed invention makes it possible to calculate data of an enhancement layer, by subtracting a reconstructed block (24) having a low resolution from this transformed mixed block (68), avoiding block artifacts for blocks laying on an area with different resolutions.

Katata et al. propose the use of weighting pixels in reference to the alpha-plane to reconstruct blocks. The source image is first split into blocks having a same resolution, the blocks are coded and then the coefficients are weighted according to the alpha plane defining the high-resolution parts of the image. In essence, Katata et al. merely weight single resolution blocks. Thus, Katata et al. solve the problem of artifacts in a way fundamentally different from the present claimed invention, as the present claimed invention constructs mixed blocks pixel by pixel for transformation in the frequency

domain and Katata et al. describe using a prepared alpha plane or gradation for weighting coefficients of single resolution blocks (see bottom of col. 14 and top of col. 15).

As claims 3, 5-6, 8-10, 19 and 20 are dependant on Independent claim 1 it is respectfully submitted that these claims are allowable for the same reasons discussed above regarding claim 1. In view of the above remarks it is respectfully submitted that claims 3, 5-6, 8-10, 19 and 20 are also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. showing the above discussed features. It is thus further respectfully submitted that claims 1, 3, 5-6, 8-10, 19 and 20 are patentable over Katata et al. and that this rejection is satisfied and should be withdrawn.

Rejection of Claims 2, 11-17 under 35 USC § 103(a)

Claims 2, 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katata '061 in view of Li (US Patent Application No. 2002/0051488).

Katata et al. and Li, when taken alone or in combination, neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. Li describes a generic spatially-scalable shape encoding apparatus for handling different mask decomposition methods. The generic spatially-scalable shape encoding apparatus applies three encoding steps to maximize the coding efficiency of the encoder. The three steps include mask mode encoding, base mask layer coding and enhancement mask layer encoding.

The Office Action asserts that Li disclose the principles of the present claimed invention. However, Li, similarly to Katata et al., is not concerned with mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone as in the present claimed invention. Li is not concerned with detecting mixed blocks, constructing mixed blocks by assigning a resolution to each of it's pixels or transforming the mixed blcoks in the frequency domain.

The Office Action further asserts that the combination of the systems of Katata et al. and Li disclose the principles of the present claimed invention. However, the combined system, similarly to the individual systems of Katata et al. and Li, would neither disclose nor suggest a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. The combined system, similarly to the individual systems of Katata et al. and Li, would not be concerned with detecting mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone, constructing the mixed blocks by assigning a resolution to each of it's pixels or transforming the mixed blcoks in the frequency domain.

As claims 2 and 11-17 are dependant on Independent claim 1 it is respectfully submitted that they are allowable for the same reasons as discussed above in respect to claim 1. In view of the above remarks it is respectfully submitted that claims 2 and 11-17 are also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. and Li, when taken alone or in combination, showing the above discussed features. It is thus further respectfully submitted that claims 2 and 11-17 are patentable over Katata et al. and Li, when taken alone or in combination, and that this rejection is satisfied and

should be withdrawn.

Rejection of Claim 7 under 35 USC § 103(a)

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katata et al. in view of the admitted prior art.

Katata et al. and the Admitted Prior Art neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

The Office Action asserts that Katata et al. disclose transforming data from a frequency domain to a spatial domain. However, Katata et al. neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. Katata et al., as discussed above in regards to claim 1, are not concerned with mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone as in the present claimed invention. Accordingly, Katata et al. are not concerned with detecting mixed blocks, constructing mixed blocks by assigning a resolutions to each of it's pixels or transforming the mixed blcoks in the frequency domain.

Additionally, the Office Action asserts that the admitted prior art, in particular Fig. 1, discloses allocating to each pixel of the mixed block the resolution of its

corresponding zone. However, the prior art, similarly to Katata et al., neither discloses nor suggests a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. As discussed above in regards to claim 1, the process of the prior art in Figure 1 designates whole objects as selections to be encoded at a higher quality using block encoding. The process exhibits "anomalies of resolution at the boundaries between the zone or zones of interest and the background zone or zones" (Page 4, lines 22-25). The present invention corrects this distortion of the boundaries by locating the blocks which lie on the boundaries between the zones of interest and the background, analyzing them to determine to which zone each pixel belongs and assigning them the value of its determined zone. Thus, the present claimed invention is an improvement to the systems of the prior art and Katata et al., minimizing artefacts by accounting for blocks of mixed resolution.

The Office Action asserts that the combination of the systems of the prior art and Katata et al. discloses the principles of the present claimed invention. However, the combined system, similarly to the individual systems of the prior art and Katata et al., neither discloses nor suggests a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. Similarly to the individual systems of the prior art and Katata et al., the combined system would not be concerned with correcting this distortion of the boundaries by locating the blocks which lie on the boundaries between the zones of interest and the background, analyzing them to determine to which zone each pixel

belongs and assigning them the value of its determined zone and transforming the mixed block in the frequency domain.

As claim 7 is dependant in independent claim 1, it is respectfully submitted that claim 7 is allowable for the same reasons as discussed above in respect to claim 1. In view of the above remarks it is respectfully submitted that claim 7 is also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. and the admitted prior art, when taken alone or in combination, showing the above discussed features. It is thus further respectfully submitted that claim 7 is patentable over Katata et al. and the admitted prior art , when taken alone or in combination, and that this rejection is satisfied and should be withdrawn.

Rejection of Claim 4 under 35 USC § 103(a)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katata et al. in view of Jiang (US Patent Application No. 2002/0118743).

Katata et al. and Jiang, when taken alone or in combination, neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

Jiang describes a post-clipping method in the coding system for fine granularity scalability (FGS) video coding. The FGS enhancement layer encoding and decoding operations can be mapped to simple motion compensation operations. The Office Action

asserts that Jiang discloses the principles of the present claimed invention. However, Jiang, similarly to Katata et al., neither discloses nor suggests a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. Jiang, similarly to Katata et al. and Li, is not concerned with mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone as in the present claimed invention. Accordingly, Jiang is not concerned with detecting mixed blocks, constructing mixed blocks by assigning a resolution to each of it's pixels or transforming the mixed blocks in the frequency domain.

The Office Action asserts that the combination of the systems of Katata et al. and Jiang discloses the principles of the present claimed invention. However, the combined system, similarly to the individual systems of Katata et al. and Jiang, would not be concerned with the detection of mixed blocks, the allocation of the resolution of each pixel according to its corresponding zone and the transformation of the mixed blocks in the frequency domain as in the present claimed invention. Therefore, the combined system, similarly to the individual systems of Katata et al. and Jiang, would neither disclose nor suggest a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

As claim 4 is dependant on Independent claim 1 it is respectfully submitted that they are allowable for the same reasons as discussed above in respect to claim 1. In view of the above remarks it is respectfully submitted that claim 4 is also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. and Jiang, when taken alone or in combination, showing the above discussed features. It is thus further respectfully submitted that claim 4 is patentable over Katata et al. and Jiang, when taken alone or in combination, and that this rejection is satisfied and should be withdrawn.

Having fully addressed the Examiner's rejections, it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fee is believed due. However, if a fee is due, please charge the fee to Deposit Account 07-0832.

Respectfully submitted,
Anita Orhand

By: _____
Jack Schwartz
Reg. No. 34,721
Tel. No. (609)734-6866

Thomson Licensing Inc.
Patent Operations
PO Box 5312
Princeton, NJ 08543-5312
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